WHAT IS CLAIMED IS:

1. A lapping apparatus for lapping a workpiece on a lapping plate, comprising:

a bridge provided so as to stride said lapping plate;

a reciprocating motion drive unit having a slider table;

a workpiece holding device for holding the workpiece;

an angle adjustment mechanism with a locking mechanism for adjusting a relative orientation of the surface of said workpiece to be lapped and the surface of said lapping plate; and

an L-shaped slide plate having a slide guide which is movable in a direction substantially perpendicular to a movement direction of said reciprocating motion drive unit,

wherein said L-shaped slide plate mounted with said workpiece holding device on said slide guide is firmly attached to said angle adjustment mechanism, and said reciprocating motion drive unit mounted with said angle adjustment mechanism on said slider table is firmly attached to said bridge so that an angle between the surface of said workpiece to be lapped and the surface of said lapping plate is kept substantially constant.

2. A lapping apparatus for lapping a workpiece on a lapping plate, comprising:

a bridge provided so as to stride said lapping plate;

a reciprocating motion drive unit having a slider table;

a workpiece holding device for holding the workpiece;

an angle adjustment mechanism with a locking mechanism for adjusting a relative orientation of the surface of said workpiece to be lapped and the surface of said lapping plate; and

an L-shaped slide plate having a slide guide which is movable in a direction substantially perpendicular to a movement direction of said reciprocating motion drive unit,

wherein said L-shaped slide plate mounted with said workpiece holding device on said slide guide is firmly attached to said angle adjustment mechanism, and said reciprocating motion drive unit mounted with said angle adjustment mechanism on said slider table is firmly attached to said bridge so that the surface of said workpiece is substantially parallel with the surface of said lapping plate.

3. A lapping apparatus for lapping a workpiece on a lapping plate, comprising:

a bridge provided so as to stride said lapping plate;

a reciprocating motion drive unit having a slider table;

a workpiece holding device for holding the workpiece;

an angle adjustment mechanism with a locking mechanism for adjusting a relative orientation of the surface of said workpiece to be lapped and the surface of said lapping plate; and

an L-shaped slide plate having a slide guide which is movable in a direction substantially perpendicular to a movement direction of said reciprocating motion drive unit,

wherein said L-shaped slide plate mounted with said workpiece holding device on said slide guide is firmly attached to said angle adjustment mechanism, and said reciprocating motion drive unit mounted with said angle adjustment mechanism on said slider table is firmly attached to said bridge so that an angle between the surface of said workpiece and the surface of said lapping plate is kept substantially constant during the time when said workpiece is being lapped.

4. A lapping apparatus for lapping a workpiece on a lapping plate, comprising:

a bridge provided so as to stride said lapping plate;

a reciprocating motion drive unit having a slider table;

a workpiece holding device for holding the workpiece;

an angle adjustment mechanism with a locking

mechanism for adjusting a relative orientation of the surface of said workpiece to be lapped and the surface of said lapping plate; and

an L-shaped slide plate having a slide guide which is movable in a direction substantially perpendicular to a movement direction of said reciprocating motion drive unit,

wherein said L-shaped slide plate mounted with said workpiece holding device on said slide guide is firmly attached to said angle adjustment mechanism, and said reciprocating motion drive unit mounted with said angle adjustment mechanism on said slider table is firmly attached to said bridge so that the surface of said workpiece is substantially parallel with the surface of said lapping plate during the time when said workpiece is being lapped.

5. The lapping apparatus according to claim 1, wherein the rigidity of said workpiece holding device with respect to at least the reciprocating motion direction of said reciprocating motion drive unit or the rotation direction of said lapping plate is not less than 0.2 N/μm.

6. The lapping apparatus according to claim 3, wherein the rigidity of said workpiece holding device with respect to at least the reciprocating motion direction of said reciprocating motion drive unit or the rotation direction of said lapping plate is not less than 0.2 N/μm.

7. The lapping apparatus according to claim 1, wherein said workpiece is mounted to said workpiece holding device via a detachable workpiece holding jig.

8. The lapping apparatus according to claim 3, wherein said workpiece is mounted to said workpiece holding device via a detachable workpiece holding jig.

9. The lapping apparatus according to claim 7, wherein said workpiece is mounted to said workpiece holding jig with a rubber-like elastic sheet being interposed therebetween.

10. The lapping apparatus according to claim 8, wherein said workpiece is mounted to said workpiece holding jig with a rubber-like elastic sheet being interposed therebetween.

11. The lapping apparatus according to claim 1, wherein said angle adjustment mechanism, which consists of a pair of angle adjustment portions driven in an arc form in the direction perpendicular to each other, enables three-dimensional adjustment of the relative position of the surface of said workpiece and the surface of said lapping plate.

12. The lapping apparatus according to claim 3, wherein said angle adjustment mechanism, which consists of a pair of angle adjustment portions driven in an arc form in the direction perpendicular to each other, enables three-dimensional adjustment of the relative position of the surface of said workpiece and the surface of said lapping plate.

13. The lapping apparatus according to claim 1, wherein said angle adjustment mechanism, which consists of two gonio-stages stacked in two tiers so that the axis of rotation thereof is parallel with the surface of said lapping plate and an angle between two axes of rotation thereof is 90 degrees, adjusts the normal direction of the surface of said workpiece to be lapped three-dimensionally in the range of about ±15 degrees from the vertical direction with respect to the surface of said lapping plate, and fixes the relative orientation of said workpiece and the surface of said lapping plate by means of a locking mechanism.

14. The lapping apparatus according to claim 3, wherein said angle adjustment mechanism, which consists of two gonio-stages stacked in two tiers so that the axis of rotation thereof is parallel with the surface of said lapping plate and an angle between two axes of rotation thereof is 90 degrees, adjusts the normal direction of the surface of said workpiece to be lapped three-dimensionally in the range of about ±15 degrees from the vertical direction with respect to the surface of said lapping plate, and fixes the relative orientation of said workpiece and the surface of said lapping plate by means of a locking mechanism.

15. A magnetic head formed with a magneto-resistive element held between shield portions on a substrate, wherein an air bearing surface is formed by lapping said magneto-resistive element including said

shield portions, and said air bearing surface is formed with a lapping trace having an angle of a predetermined range with respect to the lengthwise direction of said magneto-resistive element.

16. A magnetic head according to claim 15, wherein an element recession measured as a level difference between said substrate and said shield portions on said air bearing surface is not more than 1 nm.

17. A method of manufacturing a magnetic head in which a workpiece having a plurality of magnetic heads is lapped on a lapping plate, comprising a process of lapping in which the surface of said workpiece to be lapped is lapped by using at least the reciprocating motion of said workpiece or the rotating motion of said lapping plate,

wherein during the time when said process of lapping is being performed, said workpiece is lapped while an angle between the surface of said workpiece and the surface of said lapping plate is kept substantially constant.

18. A method of manufacturing a magnetic head in which a workpiece having a plurality of magnetic heads is lapped on a lapping plate, comprising a process of lapping in which the surface of said workpiece to be lapped is lapped by using at least the reciprocating motion of said workpiece or the rotating motion of said lapping plate,

wherein during the time when said process of lapping is being performed, said workpiece is lapped while the surface of said workpiece and the surface of said lapping plate are kept substantially parallel with each other.

19. The method of manufacturing a magnetic head according to claim 17, wherein said workpiece to be lapped is lapped by using fixed abrasives such that a part of abrasive is embedded in said lapping plate and remaining portion thereof is exposed on said lapping plate.

20. The method of manufacturing a magnetic head according to claim 18, wherein said workpiece to be lapped is lapped by using fixed abrasives such that a part of abrasive is embedded in said lapping plate and remaining portion thereof is exposed on said lapping plate.

21. The method of manufacturing a magnetic head according to claim 17, wherein the relative position of the surface of said workpiece to be lapped and the surface of said lapping plate is adjusted in advance, and during the time when said workpiece is being lapped, said workpiece is lapped while said relative position is kept.

22. The method of manufacturing a magnetic head according to claim 18, wherein the relative position of the surface of said workpiece to be lapped and the surface of said lapping plate is adjusted in advance,

and during the time when said workpiece is being lapped, said workpiece is lapped while said relative position is kept.

23. The method of manufacturing a magnetic head according to claim 17, wherein said method comprises a second process of lapping in which, after said process of lapping, said workpiece to be lapped is lapped by using reciprocating motion of said workpiece with the rotational rate of said lapping plate being decreased to a predetermined range.

24. The method of manufacturing a magnetic head according to claim 18, wherein said method comprises a second process of lapping in which, after said process of lapping, said workpiece to be lapped is lapped by using reciprocating motion of said workpiece with the rotational rate of said lapping plate being decreased to a predetermined range.

25. The method of manufacturing a magnetic head according to claim 17, wherein when said workpiece is brought close to and in contact with the surface of said lapping plate, said lapping plate is rotated and/or said workpiece is reciprocated prior to lapping operation, subsequently lapping operation being performed by the sliding motion of said workpiece on said lapping surface plate by bringing said workpiece into contact with said lapping plate, and at the time when lapping operation is finished, said workpiece is separated from said lapping plate while the

reciprocating motion of said workpiece is maintained.

26. The method of manufacturing a magnetic head according to claim 18, wherein when said workpiece to be lapped is brought close to and in contact with the surface of said lapping plate, said lapping plate is rotated and/or said workpiece is reciprocated prior to lapping operation, subsequently lapping operation being performed by the sliding motion of said workpiece on said lapping plate by bringing said workpiece into contact with said lapping plate, and at the time when lapping operation is finished, said workpiece is separated from said lapping surface plate while the reciprocating motion of said workpiece is maintained.